



# Oregon

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October 12, 2011

Todd Slater  
Legacy Site Services LLC  
486 Thomas Jones Way  
Exton, Pennsylvania 19341

Re: Ecological Soil Screening Level Values for PCDDs and PCDFs  
Arkema, Portland ECSI #398

Dear Mr. Slater:

In correspondence dated May 23, 2011 the Oregon Department of Environmental Quality (DEQ) provided review comments on the November 17, 2010 *Review of Ecological Soil Screening Level Values for PCDDs and PCDFs Technical Memorandum, Arkema Inc., Portland Facility* prepared by Integral Consulting for Legacy Site Services. The DEQ review required Legacy Site Services to revise the memorandum to reflect the requested modifications and corrections identified in the May 23 DEQ review comments. In response, Legacy Site Services submitted a June 17, 2011 revised technical memorandum *Addendum to January 16, 2009 Arkema Upland Level II ERA Ecological Soil Screening Level Values for PCDDs and PCDFs* and a letter providing responses to DEQ's May 23 review comments.

The June 17 revised memorandum did not adequately address the requested modifications. The key issue is the modeling of bioaccumulation on a congener-specific basis. Bioaccumulation properties vary from tetra-chlorinated congeners to octa-chlorinated congeners. The best approach, as requested in DEQ's May 23 review comments, is to model each congener, rather than assume all the different congeners have bioaccumulation properties equivalent to the most toxic congener, 2,3,7,8-TCDD. Also, EPA and DEQ consider it appropriate to use a bioaccumulation factors (BAF) approach to model bioaccumulation of congeners into animals, rather than use a regression relationship for 2,3,7,8-TCDD that has not been determined to be representative of the other congeners.

This approach of congener-specific modeling is presented in EPA's guidance on the application of toxicity equivalence methodology for polychlorinated dioxins, furans and biphenyls in ecological risk assessment (EPA, 2008). EPA states the following:

It is imperative that chemical concentrations in abiotic media be converted to concentrations in either the tissues of organisms being assessed or their food through use of appropriate bioaccumulation factors or models **prior** to applying [toxic equivalency factors] TEFs-WHO98/05. For example, BAFs can be applied to [polychlorinated

dibenzodioxins] PCDDs and [polychlorinated dibenzofurans] PCDFs concentrations in media to obtain predicted concentrations in organisms. It follows that [toxic equivalents] TEQs should generally not be directly based on water, sediment, or soil, since these media are inconsistent with the dosimetry basis for the toxicity equivalence model. (EPA, 2008)

Legacy Site Services made similar statements in support of congener-specific modeling on page 7 of the November 17, 2010 technical memorandum. DEQ agrees with EPA guidance and Legacy Site Services' prior statements that bioaccumulation modeling of each congener must occur prior to applying TEFs to calculate a TCDD TEQ. Although we identified errors in the comparison of the congener SLVs to site soil concentrations and the calculation of TCDD TEQ, DEQ accepted the approach used by Legacy Site Services in the initial November 2010 evaluation. In both the November 17, 2010 and the June 2011 technical memoranda, Legacy Site Services modified the approach outlined above by calculating a TCDD total TEQ in soil and modeling the TEQ into tissue using a regression analysis appropriate for only 2,3,7,8-TCDD. This altered approach is inconsistent with EPA guidance and inconsistent with prior statements by Legacy Site Services.

In addition, even if a regression equation developed for 2,3,7,8-TCDD were applicable to other congeners, the equation should be applied to actual congener concentrations in soil, not TCDD TEQs. The altered approach underestimates TEQ concentrations in tissue. For all of these reasons, DEQ disapproves the June 17, 2011 revised technical memorandum. Consistent with Section 8K(5) of the DEQ Order on Consent (DEQ No. LQVC-NWR-08-04), DEQ finds that Legacy Site Services did not in good faith make the requested modifications. To expedite resolution of the issues, DEQ modified the November 17, 2010 technical memorandum to incorporate the correct approach for evaluating bioaccumulation of dioxin congeners. The DEQ modified (redline) technical memorandum dated October 11, 2011 is attached. DEQ considers the October 11, 2011 redline technical memorandum to be the approved addendum to the January 16, 2009 *Arkema Upland Level II Screening, Ecological Risk Assessment*. With the completion of the ecological risk assessment, the updated hot spot evaluation is due within 45 days (November 27, 2011). DEQ review of the Legacy Site Services responses to DEQ's May 23<sup>rd</sup> review comments is also attached. The comments have been renumbered from the June 17<sup>th</sup> response as DEQ has reconstructed the original comments to maintain the comment continuity. Please contact me at (503) 229-5538 if you have any questions.

Sincerely,

Matt McClincy  
Project Manager,  
Portland Harbor Section

Cc: Jim Anderson, DEQ NWR  
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David Livermore, Integral  
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